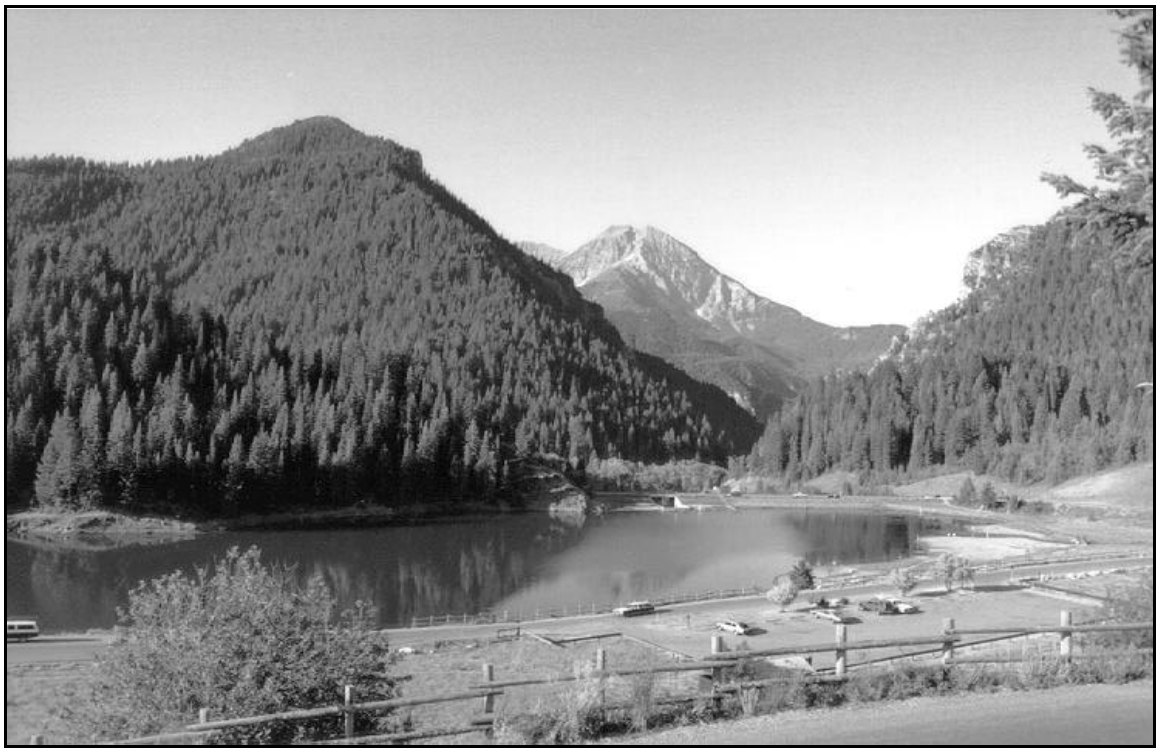
TIBBLE FORK RESERVOIR



Introduction

Tibble Fork Reservoir is a small reservoir north of Mount Timpanogos in the Wasatch Front. It is located at the point where glaciers extended furthest south in American Fork Canyon. At this point the wide canyon cut by glaciers narrows to a steep "V" profile. The view from the reservoir of the north end of Mount Timpanogos is quite spectacular, and Tibble Fork is a popular trailhead for climbing Box Elder Peak, and winter recreation in the winter.

Tibble Fork Reservoir was created in 1966 by the construction of an earth-fill dam. The reservoir shoreline is owned by the Uinta National Forest, and public access is unrestricted. Reservoir water is used primarily for irrigation, but a 166 acre-foot conservation pool is maintained throughout the year. Water use is not expected to change in the foreseeable future.

Characteristics and Morphometry

Lake elevation (meters / feet)	1,948 / 6392
Surface area (hectares / acres)	5.2 / 13
Watershed area (hectares / acres)	9,139 / 22,582
Volume (m^3 / acre-feet)	
capacity	319,477 / 259
conservation pool	207,461 / 166
Annual inflow (m^3 / acre-feet)	
Retention time (years)	
Drawdown (m^3 / acre-feet)	
Depth (meters / feet)	
maximum	10.9 / 36
mean	3.6 / 12
Length (meters / feet)	634 / 2,086
Width (meters / feet)	110 / 360
Shoreline (meters / feet)	1,536 / 5,040

Location

County	Utah
Longitude / Latitude	111 38 35 / 40 28 57
USGS Map	Timpanogos Cave, UT 1948
DeLorme's Utah Atlas & Gazetteer™	Page 53, C-3
Cataloging Unit	Utah Lake (16020201)

Recreation

Tibble Fork Reservoir is about eight miles up American Fork Canyon. From the north, exit I-15 at U-92 (Exit 287), and follow it east across the north end of Utah Valley and up

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American Fork Canyon.

From the south, go north on US-89 (State St.) to Pleasant Grove (Exit I-15 in Lindon and go east to State St.). Turn north on U-146. The intersection is poorly marked, but it has a small sign directing you to Timpanogos Cave National Monument. The Purple Turtle and Daylight Doughnuts are located on this corner. Follow U-146 to U-92 and go up the canyon.

About 3 miles past Timpanogos Cave, turn left on U-144 and go two more miles to the reservoir. All routes to the reservoir are paved, and plowed year round.

Fishing, boating, snowmobiling, cross-country skiing, swimming, camping, picnicking, and hiking are all popular. The reservoir is small for boating, but it is generally possible to get a boat on the reservoir for fishing.

Recreational facilities at the reservoir include parking areas and latrines. There are numerous USFS campgrounds in the vicinity, including Granite Flat (above Tibble Fork towards Silver Lake Flat Reservoir) and Mile Rock, Warnick, and Martin, which are along U-144 below the reservoir.

Watershed Description

Tibble Fork Reservoir is located halfway from the headwaters of American Fork Canyon to Utah Valley. The reservoir is situated at the lowest reach of the glaciers that flowed down the canyon during the last ice age. Consequently, the drive up the canyon from the valley is in the very steep, very narrow canyon that was cut by glacial runoff, and the canyon above the reservoir is broader, cut by flowing ice, and partially filled with moraines.

The north facing slopes to the south are covered with coniferous forest, while the south facing slopes have scrub oak and meadows. The forest service has attempted to plant the slopes north of the reservoir with Ponderosa Pine, a non-native tree that does well in slightly dryer areas. Abandoned mines pockmark the canyon walls for many miles above the reservoir, but the Forest Service is in the process of reclaiming them.

The watershed high point, Twin Peaks, is 3,485 m (11,433 ft) above sea level, thereby developing a complex slope of 18.4% to the reservoir. The average stream gradient above the reservoir is 7.6% (402 feet per mile) The inflow and outflow is the American Fork River. Mill Canyon Creek is also a tributary. Silver Lake Flat Reservoir is an upstream impoundment (named after Silver Lake flat, the name of the meadow it impounded), and Silver Lake is a natural lake upstream from the meadow.

The watershed is made up of high mountains, mountains meadows, and mountain valleys. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of spruce-fir, oak, subalpine meadows, alpine and aspen. The watershed receives 76 - 152 cm (30 - 60 inches) of precipitation annually, more than any other reservoir in this study. The frost-free season around the reservoir is 80 - 100 days per year, but on the mountainsides it is only 20 - 40 days per year.

Land use in the watershed is 100% multiple use, with grazing and human recreation being the primary uses. Much of the watershed lies in the Lone Peak Wilderness Area. The area has been logged and mined in the past, but such activities are not presently taking place and are unlikely to resume in the foreseeable future.

Limnological Assessment

The water quality of Tibble Fork Reservoir is excellent. It is considered to be hard with a hardness concentration value of approximately 165 mg/L ($CaCO_3$). There are no overall water column concentrations that exceed State waterquality standards for parameters tested.

Data from 1991 suggest that the reservoir is currently a nitrogen limited system but the two previous periods suggest that it was phosphorus limited. A more complete review of the data shows that the system is phosphorus limited after turnover early in the productivity season and then as the nitrogen is consumed it readily becomes nitrogen limited. TSI values indicate the reservoir is oligotrophic to low mesotrophic in a state of low productivity. The 1981 data suggested that the reservoir was eutrophic, but it appears from reviewing the data that index values were skewed toward the eutrophic range due to an abnormally low level of transparency. This could be due to turbid conditions or an erroneous data point.

The reservoir does not typically stratify due to its shallow nature as depicted in the August 8, 1991 profile.

According to DWR no fish kills have been reported in recent years, but the reservoir has been accidentally

Limnological Data

Data sampled from STORET site: 591282

Surface Data	1981	1989	1991
Trophic Status	E	O	M
Chlorophyll TSI	-	31.97	41.86
Secchi Depth TSI	56.25	36.10	43.24
Phosphorous TSI	44.52	17.35	43.66
Average TSI	50.38	28.48	42.92
Chlorophyll a (ug/L)	-	1.2	2.1
Transparency (m)	1.3	5.3	3.2
Total Phosphorous (ug/L)	20	3	16
pH	8.1	8.3	8.6
Total Susp. Solids (mg/L)	<5	-	<3
Total Volatile Solids (mg/L)	-	-	7
Total Residual Solids (mg/L)	-	-	0
Temperature (°C / °f)	10/50	13/55	11/52
Conductivity (umhos.cm)	230	432	339
Water Column Data			
Ammonia (mg/L)	0.05	<.05	0.03
Nitrate/Nitrite (mg/L)	0.25	0.19	0.06
Hardness (mg/L)	128	-	201
Alkalinity (mg/L)	102	-	137
Silica (mg/L)	-	-	7.0
Total Phosphorous (ug/L)	20	3	17
Miscellaneous Data			
Limiting Nutrient	P	P	N
DO (Mg/l) at 75% depth	10.2	9.0	8.7
Stratification (m)	NO	NO	NO
Depth at Deepest Site (m)	7	8.4	6.0

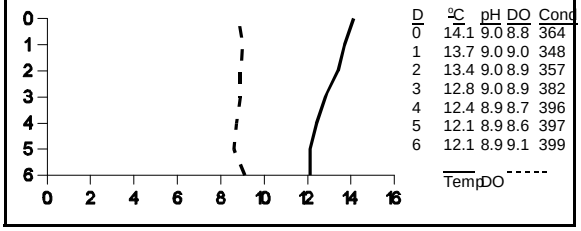
drained on occasion. The reservoir supports a population of brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*). The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake. Current stocking reports indicate that DWR stocks the lake with approximately 14,000 catchable rainbow trout annually.
In 1991, it also stocked 300 albino rainbow trout.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Pennate diatoms	0.090	61.42
Euglena sp.	0.040	27.87
Centric diatoms	0.006	4.32
Unknown chrysophyte	0.005	3.41
Ankistrodesmus falcatus	0.004	2.98
Total	00.145	

Shannon-Weaver [H']	1.01
Species Evenness	0.63
Species Richness	0.21

The phytoplankton community is dominated by the presence of diatoms, flagellates and green algae



indicative of good water quality and low production.

Pollution Assessment

Nonpoint pollution sources include the following: sedimentation and nutrient loading from grazing; litter and wastes wastes from recreation; sedimentation and increased runoff from logging; and potential contaminates and increased sedimentation from abandoned mines. Grazing takes place throughout the watershed and in the vicinity of the reservoir.

There are no point sources of pollution in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain

Information

Management Agencies	
Mountainlands Association of Governments	377-2262
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Uinta National Forest	789-1181
Pleasant Grove Ranger District	785-3563
Recreation	
Mountainlands Travel Region (Provo)	377-2262
Provo/Orem Chamber of Commerce	224-3636
American Fork Chamber of Commerce	756-5110
Reservoir Administrators	
North Utah County Water Conservation District	756-4268

(3A) and agricultural uses (4).